

2014 Career Handbook

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INTRODUCTION

Thanks for picking up a copy of the 2014 Career Handbook. Our goal with this booklet and with all the career resources from Science is to bring you useful, relevant information to help you navigate the job search process and manage your development in a way that leads you to a truly rewarding career.

To that end, we have teamed up with some great organizations to bring you information about the latest career opportunities in many different fields. The profiles shown here will give you a sense of the types of organizations that are accepting resumes and the kinds of positions they offer. We've also included some articles to help you improve your resume as well as some general tips and advice on job searching.

In addition to the companies featured in this book, you can search hundreds of additional job postings on our website ScienceCareers.org—all for free.



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CONTENTS
The Cover Letter: Relic or Still Relevant? David G. Jensen4
Opening Industry-Academic Partnerships Chris Tachibana6
Getting the Inside Scoop on Science Careers Philip S. Clifford, Jennifer A. Hobin, Cynthia N. Fuhrmann, Bill Lindstaedt
You Need a Game Plan Jennifer A. Hobin, Cynthia N. Fuhrmann, Bill Lindstaedt, Philip S. Clifford13
So You Think You Have Skills Jennifer A. Hobin, Cynthia N. Fuhrmann, Bill Lindstaedt, Philip S. Clifford
Employer Profiles FAPESP
Harvard Department of Molecular and Cellular Biology20
St. Jude Children's Research Hospital22

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The Cover Letter: Relic or Still Relevant?

By David G. Jensen—September 18, 2013

When it comes to the topic of cover letters, today there's no such thing as conventional wisdom. A quick Internet search turns up many comments from job seekers who are glad to see it go and career experts who say, "Toss it." But some people still advise, "Better write a good one; they're important."

I fall into the latter camp—but I do recognize that the role of the cover letter has changed. No longer do you introduce your resume or industry CV with a letter on the finest linen stationary; the letter will be printed out, if at all, on whatever paper the human resources (HR) department happens to have in the printer. And it's true that a lot of people don't even read cover letters.

Yet, the cover letter still serves a purpose that no other part of your application package can serve: It makes a strong, upfront, specific case for your candidacy for the position. There's no better opportunity—at least until the interview—to point out a particular strength or hammer home the reasons you'd be an especially good fit for the position.

Why Bother?

You might well ask, "Why are cover letters necessary? I just filled out six online applications and not one company required it." If you're applying online, a cover letter may not be necessary, but it's still a good idea. It's an opportunity to personalize your application. Will your letter be to an HR person? A hiring manager? If you are applying via a Web site, you probably won't know who to write to; you'll be stuck writing a "To Whom it May Concern" letter if you get to include one at all. But, when working your network, as we advise so often at *Science* Careers, you'll be able to e-mail people directly and include a nicely formatted Microsoft Word or PDF document addressed to them personally. That's the best approach.

Writing a letter also forces you to consider the uniqueness of the opportunity in front of you. You start to differentiate yourself, to focus on what you can do for them, and to sell that to the company. You should never use a "generic" cover letter that fails to make specific reference to a particular job or reader.

Another reason why a cover letter is good is that it allows you to present your strengths and accomplishments in bite-sized nuggets. That's both good practice and an effective job-search strategy. I wrote about the importance of succinct writing in part one of this series; the cover letter should carry that forward. You will, in fact, utilize one of those "Challenge-Approach-Results" (C-A-R) paragraphs from part one later in this column. But before we get to that, I'll talk about how cover letters can be an advantage to employers—even if, as you may have discovered, they don't ask for them very often.

How is the Cover Letter Received?

Just because you've written a great cover letter doesn't mean that everyone is going to read it. I did an impromptu survey of my HR friends; just 40% told me they "regularly" read the cover letter. The other 60%, though, said that they read cover letters on occasion, and that in certain situations a cover letter could be very useful.

Andrea Piccarelli, manager of human resources at The Smithers Group in Akron, Ohio, tells me that while she doesn't consistently read them, cover letters are important in several situations. "For example, if I look at the CV but notice

the home address isn't in the geographical area of our business, I will go to the cover letter to see what the applicant had to say about the potential of actually making a move," Piccarelli says in an interview.

"In another instance, there may be a very strong emphasis on communication skills for a particular job, and there's no better way to get a grasp on that than to see how they write their cover letter. Lastly, if there's a significant gap in employment—or perhaps a series of short stays in jobs—I want to see an explanation there in the cover letter."

The Mechanics of Writing the Cover Letter

The passage of time is most obvious in the cover letter's changing format and appearance. No one opens a physical envelope anymore, and even the fax has mostly vanished. Your choice, then, is whether to work up a nicely formatted Microsoft Word or PDF version and incorporate it as page one of the CV—or, as most people do, separate them into two separate documents. If you're applying online, you'll probably just paste your cover-letter text into a box.

Piccarelli offers another option: She says that, if you're sending your package by e-mail, it's OK to put your coverletter points in the e-mail that encloses the CV, and many people would agree with her. Unfortunately, not everyone prints out the email when they circulate an enclosure. Take me: If I want to hand my client a binder of our candidates for a search, I'll routinely print cover letters and CVs, but I never print an e-mail. If you want to ensure that everyone reads your covering statements, you stand a better chance with a separate, stand-alone document.

Consider the cover letter your first piece of eloquent business writing. It's a sales tool. It is not meant to be a restatement of what is in your CV, or a multipage ramble on what you've done at work and what you want out of life. The cover letter should be a clearly written, succinct, three-paragraph summary that teases the reader into wanting to know more about you. It's formulaic, or should be.

- Paragraph One This is where you explain how you and the reader are connected. "You'll recall that we met at the PAG 2013 meeting in San Diego where we had a cup of coffee with our mutual friend Dan." Or, "I saw the advertisement for a senior scientist in your process development team and wanted to draw your attention to my CV." I don't think you should ever write a "To Whom it May Concern" letter, but you may not be able to avoid it if you are applying via their online application process.
- ▶ Paragraph Two This is the critical paragraph, where you bring out the big gun—your most relevant accomplishment—and entice the reader to look at your CV. In part one of this article I told you how to write a succinct statement about your accomplishments, via the C-A-R exercise. Here's where you put that to use. "I'm sure that the scientist you hire for process development will need to have great critical-thinking skills to aid the company's program in microbial process development. I demonstrated such skills, to cite one example, after my boss asked me to resolve a problem where a bench-scale E. coli fermentation had dropped 20% in yield, suddenly and without apparent cause. My approach was to take it back to shake flasks and do a bioanalytical study. I found a way to improve the media and we were able to get the process up and running again, with a 7% increase in throughput for the secondary metabolite of interest."
- ▶ Paragraph Three In marketing circles, this is known as the "call to action." Whether you are writing a Web page for a product or a cover letter for an employment package, the call to action provides critical closure for your message. Marketing experts will tell you that the key to a call to action lies in its simplicity, so don't overdo it. The goal is to suggest what should happen next: "I would love to have an opportunity to meet with you or your HR business partner, in person or by phone, to discuss your company's needs and my fit with those needs. Alternatively, I'll be in Boston next month for the American Society for Microbiology meeting; I'll check in with you beforehand to see if we can meet." If there are any "issues" with your CV—a long gap due to illness, parenting, or unemployment, for example—this is the paragraph where those should be defused.

That's all you need: three simple paragraphs, fine-tuned to make the best possible impression and illustrate that you match the employer's requirements. Whether it is an e-mail or, better, a nicely formatted Microsoft Word document or PDF, don't miss this opportunity to reinforce your fit to the job, or to clarify some issue that otherwise might scare people off. While it may not be as important, or as widely read, as it once was, the cover letter remains an important tool in finding a job.

Opening Industry-Academic Partnerships

By Chris Tachibana—April 12, 2013



A line between industry and academic research began blurring in the late 20th century. Biotechnology companies such as Genentech in South San Francisco encouraged their scientists to pursue side projects and publish results. Universities started pushing technology transfer and translating research into products. Today, partnerships between corporations and academia are common, although success requires careful advance planning.

Industry-academic collaborations are like partners skilled in different dances trying to reach a compromise between waltz and salsa. Rhythms, pace, and expected outcomes can be frustratingly at odds, as university researchers prioritize education and basic research and corporate scientists pursue products and profits. Success depends on finding common goals and negotiating plans that pay off financially and intellectually for all parties.

Let's Start at the Very Beginning

An entry-level option for academic and industry investigators who want to collaborate is co-advising a Ph.D. student. The Danish Ministry of Science, Innovation and Higher Education sponsors an Industrial Ph.D. program that, in its current form, has funded more than a thousand projects since 2002, most in health, natural sciences, and technology. The European Commission Marie Curie Actions has a similar initiative based on the Danish program.

Industrial Ph.D. projects highlight the difficulties of satisfying both academic and business interests. Some professors say they appreciate the funding and credit for graduating a Ph.D. student, but are challenged to find projects that advance their research while meeting an industry need. For students, however, working in industry while getting a university degree is a chance to experience both worlds.

Julie Christina Grew has a Master's degree in public health and is earning an industrial Ph.D. with the University of Copenhagen and the medical device company Medtronic, whose world headquarters is in Minneapolis, Minnesota. Grew's project is an anthropological analysis of patients with devices similar to pacemakers that monitor heart rhythm. She hopes her research will launch a career in patient-oriented work for a pharmaceutical or medical device company. Grew appreciates the networking opportunities that come with her training. "It's a chance to get into industry and see what it is like to take something from an idea to real life, to make things better for patients with chronic diseases," she says.

At Medtronic Denmark, Elisabeth Reimer Rasmussen's expertise in health economics, policy, and public affairs made her a natural fit to be Grew's industry contact. Although the company was not seeking to host a Ph.D. student with an anthropologist's outlook, Rasmussen says Grew's fresh perspective has already changed thinking about patient satisfaction. And corporations know, says Rasmussen, "If you want to stay ahead, you have to see things in different ways."

Make Connections

Industry and academic scientists whose careers are already under way can connect through initiatives from companies, governments, and private organizations. Industry Fellowships from the Royal Society, the United Kingdom's national academy of science, support open-ended industry-academic collaborations. "The guiding principles of the fellowship are pure, excellent science," says Joe Sweeney, professor of catalysis and chemical biology, University of Huddersfield, West Yorkshire, England. Sweeney has a fellowship to work with AstraZeneca, which has its corporate headquarters in London and its research headquarters in Södertälje, Sweden, and he is helping to increase networking and knowledge-sharing among the program's participants. The business exposure is a benefit, he says: "My own



Industry-academic collaborations are like partners skilled in different dances trying to reach a compromise between waltz and salsa.

university research has improved through what I've learned from industry practices about management, engagement with funding agencies, and identifying translational opportunities."

On the industry side, Lilly, headquartered in Indianapolis, Indiana, has a program that encourages scientists at the pharmaceutical company to collaborate with university researchers. The Lilly Research Awards Program (LRAP) funds precompetitive research proposals developed jointly by Lilly and university scientists. James Stevens, a Lilly distinguished research fellow, says the goals are fostering innovation and cultivating professional relationships. "LRAP allows our scientists to pursue lifelong learning," he says. "But we also expect returns on investment in innovation and in the development of our scientists." LRAP allows Lilly scientists to work with academic researchers on high-risk projects. Experiments are conducted at the academic laboratory, and Lilly scientists contribute data analysis, project planning, and other virtual activities.

Open Wide

Also virtual, but more directly targeted to Lilly interests is the Open Innovation Drug Discovery initiatives. Alan Palkowitz, Lilly vice president of discovery chemistry and technologies, says open innovation programs are born of the realization, especially by pharmaceutical companies, that "we can't do it alone; our current challenges are too big and complex."

The program is a global, crowdsourced drug candidate search. Scientists working on molecules with therapeutic potential in specific areas such as anti-angiogenesis send them to Lilly. Company scientists perform high throughput assays and screens and send data to the scientists. "Access to external compounds in exchange for biological data—that's the currency we have developed," says Palkowitz. "We evaluate the commercial potential of compounds to be optimized into drug candidates. In exchange for the data, Lilly gets first right of access for promising compounds."

Cultivating long-term relationships is a goal. Palkowitz describes the academic partners as customers as well as collaborators and says Lilly wants the scientists to return to the program as they find new drug candidates. Lilly crafts agreements that ensure confidentiality about the scientists' compounds, offer mutually beneficial intellectual property rights, and allow publication of the data. Says Palkowitz, "This program will live and die based on the experiences the scientists have, so we put effort into serving their interests, first and foremost."

While the Lilly model is virtual, Pfizer is investing in an open innovation model based on face-to-face, side-by-side collaborations. The company, which has corporate headquarters in New York, deployed 90 of their own scientists to Centers for Therapeutic Innovations (CTIs) at three U.S. locations so far: San Francisco/San Diego, New York, and Boston. The CTIs have Pfizer laboratory space near academic medical research centers and five-year collaboration agreements with universities.

CTI projects—currently, about 20 are in progress—begin with academic scientists proposing research on protein-based drugs, such as therapeutic antibodies. Accepted proposals, evaluated by a joint industry-academic committee, receive staff funding, supplies, and access to company resources such as antibody libraries and instruments. Pfizer and academic scientists do the research, directed by Pfizer project managers. The endpoint is a proof-of-mechanism clinical trial, after which Pfizer has the first option to develop the potential therapy. Collaboration barriers such as material transfer agreements are removed in advance. Intellectual property arrangements recognize academic interests: at project completion, if Pfizer is not interested, rights to the candidate therapy revert to the university for further study or development.



"Everybody is under pressure—academia, pharmaceutical companies it encourages collaborating effectively." **Stuart A. Aaronson**

Stuart A. Aaronson, chair of oncological sciences, Icahn School of Medicine at Mount Sinai in New York City, and Gadi Bornstein, Pfizer associate research fellow, are collaborators at the New York-based CTI. Their project is developing therapeutic antibodies against an oncogenic target. "It's been a good experience," says Aaronson. "We feel like we're moving together to a common goal, and we've had consensus so far on what's important to pursue." Although they have clear deadlines and deliverables, the academic scientists have not felt limited, says Aaronson. "Everyone appreciates that learning more about the target is helpful to the whole project." Success depends on this mutual vision and contribution, says Bornstein. "The academic scientists have the biological experience with the target system, and Pfizer has the drug discovery expertise."

CTI projects have hard deadlines, and they are not basic research projects. The mechanism "doesn't work for everybody in academia and is not a replacement for NIH grants," says Anthony Coyle, Pfizer chief scientific officer, adding that "total transparency" is crucial. "Up front, everyone must appreciate that funding strictly depends on meeting timelines, so goals and expectations must be aligned, with everyone on the same page about priorities, specific aims, and go/no-go decisions. But we work as a team to achieve pre-agreed steps." In the next year or so, Coyle expects the first clinical trials from CTIs to start, with three to five candidate proteins identified for trials each year, starting in 2013.

Get Everyone Into the Act

Open innovation is now a megamodel, underlying partnerships of companies, universities, government agencies, and philanthropic organizations. The Innovative Medicines Initiative (IMI) is a public-private endeavor based in Belgium with a €2 billion (approximately US\$2.6 billion) budget. Funding comes from the European Commission (EC) and in-kind contributions such as research activities from members of the European Federation of Pharmaceutical Industries and Associations (EFPIA). Governed by EFPIA and EC representatives and guided by scientific advisors and European Union member state representatives, the IMI is accelerating new medicine development. Michel Goldman, executive director, says that the IMI was founded in 2008 because European investment in drug development was declining, with severe economic effects: "To the EC and EFPIA, it was clear that the only way to restore European competitiveness in drug development was through collaboration."

The IMI funds multinational consortia of companies, universities, hospitals, small businesses, regulatory agencies, and patient organizations. Projects address areas ranging from diabetes to schizophrenia. From the perspective of managing one of the world's largest private-public partnerships, Goldman says that teamwork among diverse entities can happen "if all parties agree to work toward common objectives, and if each partner is given a clear mission and is carefully evaluated to make sure they are adding value."

The IMI acts as a trusted neutral party that brings businesses, universities, and government agencies together. By cooperating, these diverse entities can take on challenges that are important to all partners, but neglected because they are high risk or have low profit potential, such as developing new antibiotics. Goldman says the IMI also provides a platform for agencies such as the U.S. Food and Drug Administration and the European Medicines Agency to discuss novel regulatory approaches to getting drugs to patients quickly while ensuring safety and efficacy. As

part of the IMI's educational mission, it has five programs for training in regulatory science, including programs in pharmacovigilance and new approaches to toxicology.

GlaxoSmithKline, headquartered in London, is participating in IMI antibiotic initiatives. Andreas Heddini is a medical advisor with the company, and confirms the importance of the IMI in bringing together parties whose interests don't always align. The IMI is crucial for advancing antibiotic development, says Heddini. "This is a critical area for infectious disease, but it has been neglected for decades. The initiative is great because it has three components: it leads to an increased understanding of resistance mechanisms, brings new candidate drugs forward, and provides a way to share data, including about what does not work."

Data and knowledge-sharing are also essential to the TB Drug Accelerator program. This tuberculosis initiative is just one of many programs supported by the Bill & Melinda Gates Foundation, a philanthropic organization based in Seattle that invests in global health. The TB Drug Accelerator partners include the U.S. National Institutes of Health, six research institutions, and seven pharmaceutical companies. The Wellcome Trust, a charitable organization based in London, is also a contributor.

A major challenge to fighting tuberculosis is the six-month treatment regimen, says Ken Duncan, Gates Foundation deputy director of Global Health Discovery. The TB Drug Accelerator program is seeking medicines that shorten the therapy to a month or less. Companies in the partnership supply compound libraries and drug discovery expertise to the effort, while academic partners contribute knowledge about the disease and facilities for screens and assays. The Foundation, says Duncan, provides financial support and project coordination, setting timelines and milestones and monitoring progress. "Our most important function," he says, "is integration—bringing everybody together."

Duncan, who spent 16 years at GlaxoSmithKline working on diseases of the developing world, says companies in the TB Drug Accelerator program have an unusually open agreement. This includes sharing drug candidate structures and positive and negative results. The consortium will put data in the public domain as quickly as possible, to help prevent research redundancy. While the commercial potential might not be immediate, Duncan says the collaboration could yield concrete rewards for the companies, such as new R&D avenues from identification of novel drug targets. In addition, he says, "the scientists get to apply their energy and expertise to help solve a medical problem and have an impact on global health."

Where We Go From Here

Patients and patient advocacy groups are now joining private-public partnerships as advisors, connections to trial participants, and conduits for results. Potential users of new therapies can provide valuable insights during development. Patients can also help companies and regulatory agencies explain their products and policies to the general public.

Collaborations among industry, academia, foundations, governments, and end users are becoming more common. The result is a dynamic R&D environment that fits the networked, integrated, and interdisciplinary way people live and work today. Driving open innovation is tight budgets all around. "Everybody is under pressure—academia, pharmaceutical companies—it encourages collaborating effectively," says Mt. Sinai's Aaronson.

Regardless of partners, collaborative success rests on three principles: a mutual interest in a common, achievable goal; constant communication about expectations, timelines, and rewards; and transparency throughout the project. Joe Sweeney says, "In my experience, almost all roadblocks to collaboration have not been the project but problems with human interactions—a lack of understanding about requirements. It's important to have conversations in which all partners explain what they need from the collaboration: funding, deliverables, publications, patents. A good industry-academic partnership is set up from the start as a win-win for all sides."

Getting the Inside Scoop on Science Careers

By Philip S. Clifford, Jennifer A. Hobin, Cynthia N. Fuhrmann, Bill Lindstaedt—August 14, 2013

The concept of informational interviewing was introduced by Richard Bolles in his best-selling book, *What Color is Your Parachute*.¹ It is the process of gathering firsthand information from people who are already successful in a career that interests you. An informational interview provides an insider's view of a career path including, if you ask the right questions, the skills that are desired by employers, the day-to-day challenges, and the future of the field. You may also receive valuable tips for making a successful transition. An informational interview is the most effective way to get accurate and personally relevant information about a career path.

Interview Whom?

Convinced? Then your first step is to find people to interview. Anyone who you believe could provide information about the field you are interested in is a candidate. The more people you talk to, the more complete your picture will be. This is where your efforts to develop a robust and diversified network will pay off.

Potential candidates for informational interviews include someone you met at a conference, an expert who gave a seminar on your campus, a friend from a recreational team or social club, a relative, or an alumnus who went through your program. You might be able to find contacts through the membership lists for professional organizations to which you belong. LinkedIn is a useful tool for identifying potential contacts. Using LinkedIn, you can join groups related to your career interest, search specific companies, and ask for an introduction to people who are linked to your primary connections.

As with all aspects of networking, you should be in it for the long haul. This is not a one-time exercise, but a long-term project of building a network of connections that will allow you to make the contributions you want to make in your chosen profession.

 $^{\rm 1}$ R. N. Bolles, What Color is Your Parachute? (Ten Speed Press, New York, 2013).



An informational interview is a powerful way to get information about a career that interests you. It can also help you build self-confidence and get more interviewing experience.

Arranging an Informational Interview

Once you have identified someone who works in a career path you have decided to explore, send a formal letter, an e-mail, or a LinkedIn private message in which you introduce yourself and tell your contact how you learned about him or her. Mention any common connections—friend, alumnus of same school—since that helps to create some rapport. Request a time to talk either in person or on the phone. Let your contact know that you are seeking information—not a job. Don't be afraid of being turned down: People are remarkably willing to share information about their careers, but not everyone feels they have time.

Preparing for the Interview

Informational interviews typically last 30 minutes to an hour. This is not a lot of time so you should prepare carefully to take advantage of the time you have.

Ask questions about the person's career path and how they prepared for their position. Ask about special skills or certifications that might be necessary or recommended. Don't be afraid to ask about potentially sensitive issues such as typical salaries, work hours, and so on.

The box on page 12 provides a list of "starter" questions. As you prepare for the meeting, personalize this list to address the issues that are most important to you. This should include questions directly related to your personal values. For example, if a family-friendly career is very important to you, you may want to ask about flexible work hours, on-site daycare, and so on.

The Interview

The most important thing to remember about the actual interview is to be respectful. First of all, always be on time. During the interview, be personable but also professional. Make it clear that you do not intend to waste anyone's time.

Start with your elevator pitch: Your background, what you're currently doing, and what you hope to do next. ("I finished my Ph.D. last year in the laboratory of Dr. V, working on W, and currently I'm a postdoc in Dr. X's lab at the university of Y working on Z. Having done some career-related research, I'm thinking I might like to work in regulatory affairs. I'm seeking information about what it's like to work in that field.")

Go down your prepared list of questions, following up as needed to learn what you need to know. Remember: this is an informational interview, not a job interview, so it is not appropriate to ask about job openings in the company. (Sometimes an interviewee may volunteer this information; if that happens, feel free to pursue.)

It is a good idea to ask for contact information—or better still, an introduction—to other potential contacts. Let's say you're interviewing someone who works in the research and development division of a company, but you believe your skills and interests lean more toward a career in regulatory affairs. This is an opportunity for you to obtain contact information for someone who works in the regulatory affairs division of the same company. You can also use this as an opportunity to find out about other companies in the field. This could be of great benefit as you identify target companies for your job search.

It is important to recognize that the person you interviewed gave you their time, a precious commodity. Acknowledge this with a written "thank you" note.

General questions you might ask in an informational interview:

- 1. Would you tell me a little bit about your current responsibilities?
- **2.** Would you describe a typical day?
- **3.** How did you get into this field? What kinds of additional experience or training did you need to have in order to get a job in this field?
- **4.** What are potential future career opportunities for someone in your position?
- **5.** What types of skills and experiences are essential for succeeding in your position?
- **6.** How would you describe the culture, management style, and organization of your company?
- **7.** Would you talk about typical compensation packages within this career field, including salary range and other benefits, as well as work-life balance?
- **8.** What advice would you give someone in my position who wants to be successful in the field?
- **9.** Would you tell me anything about other firms involved in this activity or sector? Do you know of any companies that might be expanding or hiring in the next year?
- **10.** Are there professional organizations that I should consider joining or Web sites that I should be looking at to get additional information?
- **11.** Would you recommend anyone else to speak with in this field? May I have permission to use your name when I contact them?

The Follow Up

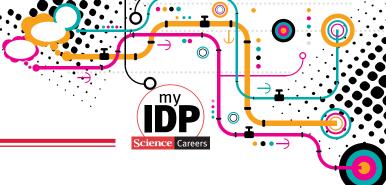
Keep notes about the things you learn from your informational interviews. The "Talk to People" section of myIDP provides a convenient way for you to keep track of the important things you gleaned from each informational interview. These notes will be helpful when you follow up later to share news about your progress.

It is important to recognize that the person you interviewed gave you their time, a precious commodity. Acknowledge this with a written "thank you" note. Whether accomplished with e-mail or with an old fashioned card, your note needs to show appreciation for the person's time, and report—very briefly—what you intend to do with what you learned. This action demonstrates your professionalism and helps solidify your connection to this new member of your network.

An informational interview is a powerful way to get information about a career that interests you. It can also help you build self-confidence and get more interviewing experience. And while an informational interview is not a direct attempt to find a job, it is a way of establishing relationships that may some day lead to new opportunities. This is one of the most valuable tools in your career toolbox. Use it.

You Need a Game Plan

By Jennifer. A. Hobin, Cynthia. N. Fuhrmann, Bill Lindstaedt, Philip S. Clifford—September 7, 2012



Scientific careers are not like the board game Monopoly. In Monopoly, the rules are clear and it's relatively easy to succeed; in fact you get \$200 just for hanging in there long enough to pass "Go" on your way to the next round. But in science, it often seems there are no definite rules and there's no guaranteed payoff for advancing to the next training round: Ph.D., postdoc, second postdoc—then what? To succeed in science, you need to have a game plan. This is especially true in the current research environment.

Challenges Facing Today's Doctoral Trainees

For scientists, finishing a Ph.D. or postdoc and automatically moving on to a research-faculty position is no longer the norm. In fact, the share of all U.S. science and engineering doctorate recipients working in academe dropped from 55% to 44% between 1973 and 2008;¹ that percentage includes postdocs, staff scientists, research and teaching faculty, and administrators. Within academe, the proportion of scientists employed in tenured or tenure-track positions has also declined (see table on age 14), likely reflecting a growth in postdoctoral, staff scientist, and other non–tenure-track slots. And with a growing population of talented trainees poised to enter the job market, the competition for sought-after academic jobs is tough. The good news is that, just like in Monopoly, there are a multitude of options from which scientists can choose when deciding on a career, and it is not uncommon for Ph.D.-level trainees to pursue nontraditional paths.²

But identifying the job that is right for you—whether in academe or beyond—takes work, and competing successfully for that job warrants a new approach to career planning. The recent focus on innovative, interdisciplinary, translational, and collaborative science—coupled with an array of new scientific tools and techniques—means that graduate students and postdocs need to master new skill sets to compete successfully for research positions both within and outside academe.

The challenges are no less for individuals pursuing careers away from the bench, where employers may place a greater emphasis on an applicant's "transferable" skills—such as leadership, management, and communication—than on their scientific and technical expertise. Such skills are difficult to acquire, and to document, during academic training.

Planning for Success

Navigating this new science careers game board can be difficult; a single strategy will not work for everyone. Although each Ph.D. scientist brings different characteristics to the career game, too rarely do we take time to analyze those individual characteristics to help formulate a plan for our careers.

We should do it more often. There is a body of literature that underscores the value of deliberate career planning. This research finds that people who develop and implement strategies to pursue career-specific goals achieve greater career success as measured by salary, promotions, and level of responsibility.³ They also report greater career satisfaction and rate themselves as more successful than their peers compared to those without career plans.⁴ A nationwide study of 7,600 postdoctoral researchers found that postdocs who developed training plans with their advisers at the start of their appointments reported greater satisfaction, published more papers, and experienced fewer conflicts with those advisers.⁵

Introducing myIDP

To help you develop your plan, we have created myIDP, an interactive, Web-based career-planning tool based on the Federation of American Societies for Experimental Biology's (FASEB's) *Individual Development Plan for Postdoctoral*

Fellows.^{6,7} Supplemented by the articles in this series, myIDP will help you identify the career goals that are right for you and develop a step-by-step plan to reach those goals.

Anonymous unpublished polls conducted by FASEB in 2009 reveal that postdocs and mentors find IDPs beneficial. The majority of postdocs who developed an IDP reported that it helped them assess their skills and abilities and identify the skills they would need to advance their careers. One respondent noted that it helped "not just to decide on a goal, but to have that goal in mind all the time."

Mentors reported similar benefits for their postdocs, and both groups found the IDP to be helpful for facilitating communication about postdocs' career goals. According to one investigator: "The IDP helped me guide my postdocs toward experiences that would benefit their own career objectives. It allowed them to better tailor their experiences toward their career paths." Graduate students at the University of California, San Francisco, reported similar beneficial effects.

Getting Started

Constructing an IDP is a four-step process with myIDP. The first step is to evaluate your own skills, values, and interests. The second step is to use this self-assessment as a guide for exploring and evaluating career opportunities in your field and, ultimately, identifying your preferred career, as well as an alternative option that you think you'd be happy with. Step three is to set some specific goals to prepare you for the career paths to which you aspire. After discussing these goals and outlining strategies with your primary mentor, it's time to put the plan into place. You do this in step four.

myIDP is designed to help you with each of these steps. It includes exercises to guide you through the self-assessment process, and it will help you determine which of 20 scientific career paths best fits your skills and interests. For each career path, there is an extensive list of resources in the form of articles, books, and professional organizations, which you can scrutinize to gain a better understanding about careers you are unfamiliar with. Finally, there is a tool to assist you in setting and achieving your goals. Throughout the process, you will be able to store your progress on the myIDP Web portal—your information will be kept private, viewable by only you and those you wish to share it with—and you can request automated reminders to help you keep on top of your deadlines. Our goal is to help you gain stronger self-awareness, identify resources and strategies, and create your own game plan for identifying, attaining, and succeeding in the career that is right for you.

Percent of doctorate recipients holding tenure and tenure-track appointments at academic institutions 3–5 years since degree

3-3 years since degree	1993	1995	1997	1999	2001	2003	2006	2008
All SEH fields	27.0	24.6	24.2	21.0	18.5	23.8	25.9	22.9
Biological, agricultural, and environmental life sciences	17.3	17.0	18.1	16.4	14.3	15.5	13.7	14.3
Computer/information sciences	55.7	37.4	40.7	25.9	17.3	32.2	45.7	37.8
Mathematics and statistics	54.9	45.5	48.1	41.0	28.9	45.5	50.6	40.7
Physical sciences	18.8	15.5	14.5	11.9	15.8	18.3	19.7	16.5
Psychology	17.0	20.7	16.8	17.6	17.5	19.9	23.8	18.3
Social sciences	54.3	52.4	50.4	46.5	38.8	46.0	50.4	48.9
Engineering	22.7	19.3	19.4	12.6	10.8	15.9	16.3	15.5
Health	47.4	40.2	41.1	39.5	25.1	40.8	43.1	34.4

Adapted from Science and Engineering Indicators 2012, Table 3–20

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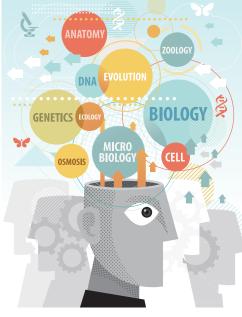
So You Think You Have Skills

By Jennifer A. Hobin, Cynthia N. Fuhrmann, Bill Lindstaedt, Philip S. Clifford — September 21, 2012



When Keren started her Ph.D. program nearly 5 years ago, the prospect of completing her thesis and setting a date for her defense seemed far off. But now the date was approaching—and the thesis and the defense weren't the only things weighing on her mind. She was also thinking, "What next?"

Until recently, Keren had assumed she'd pursue a postdoctoral position, work hard, and eventually land a tenure-track position at a research university. But now, with academic job prospects looking grim, she realized that she should investigate some alternatives in case the academic research track didn't work out.



If you're like Keren, you've spent years building the research and technical skills needed to complete your training and move into a research career. But you may not have given much thought to the other skills you've picked up along the way, how you might apply them to careers inside and outside of academe, and what additional expertise you're likely to need in order to establish your career, whatever it ends up being.

Taking Stock of Your Skills

The first step in honing your skill set is figuring out what you're good at and what needs to be improved. The myIDP skills assessment was designed to help you do just that. Created specifically for scientists, this assessment includes the knowledge, skills, and abilities emphasized in graduate and postdoctoral training and needed to succeed in a research career. It also encompasses skills that aren't a formal part of most doctoral science training but are fundamental to obtaining—and keeping—a wide range of science-related jobs. Derived from the National Postdoctoral Association's list of postdoctoral core competencies, the myIDP skills assessment has seven categories: scientific knowledge, research skills, communication, leadership and management, professionalism, responsible conduct of research, and career development. These skill areas—and the specific skills in each area—are described below. (The boldface phrases correspond to skills listed for self-evaluation at myIDP.)

Scientific Knowledge

To succeed in any discipline, you need to know the content. For scientists, this means both **a broad-based knowledge of science** and a **deep knowledge of a specific research area**. But that's not sufficient because science is dynamic; that knowledge base changes as researchers learn new things. So, to be competitive, you need to be able to **critically evaluate the scientific literature**, integrate new information about your field into your existing knowledge base, and identify gaps that are ripe for new investigation.

Research Skills

Whether you work at the bench or in the field, you must have the **research and technical skills** required to execute your studies. Over the course of your doctoral training, you need to become proficient in **study design**, the appropriate **statistical analysis of your data**, and **interpreting the results**. Throughout your scientific career, you'll face intellectual and technical challenges that will call upon your ability to **think creatively** and propose **innovative** solutions to scientific problems. And like it or not, publications are the coin of the realm in science, so once you've done great work, you have to publish it. You should become **familiar with the publishing standards** in your discipline, acquire practice writing and submitting papers for publication and dealing with reviews, and take advantage of opportunities to serve as a reviewer.





Communication

By the time you get to graduate school, you should have mastered **basic writing**, **editing**, **speaking**, **and presentation skills**; if you haven't, this should be a major and immediate focus of your skills development, because communication skills are highly valued in all careers. If you're pursuing a research career, aim for expertise in writing **scientific publications** and **grant proposals** and giving **technical talks** and **poster presentations**. You'll need to be at least moderately proficient in these areas to complete graduate and postdoctoral work and to compete for faculty positions and some research administration roles.

Communicating science to lay audiences is an important skill for all scientists because, if called upon, we all need to be ready to explain our work or demonstrate the value of public investment in research. But this set of skills is especially important for scientists who work with students, patients, policymakers, and the public. Public communication is a world apart from writing manuscripts and conference posters, and it takes a lot of practice. Expect to trade your technical jargon for language that's direct and concrete, to focus on the most essential and interesting elements of your work, and to tailor your message to your audience.

If you're planning for a teaching-focused position at a 4-year college, high school, or museum (for example), acquiring expertise in this area should be a point of emphasis. But you will benefit from teaching experience and training even if you intend to pursue a career that's more focused on research.

Mentoring is another key skill to cultivate. It's especially important for scientists in teaching and advisory positions, and it's essential for anyone seeking a leadership or management role. But mentoring others isn't the only aspect of mentoring that matters; learning how to be mentored is important, too. The support and guidance of more established scientists—and also peers—will greatly facilitate your career progress. So if you're not already comfortable **reaching out to others for assistance and advice**, you should look for opportunities to do this and begin forging relationships with potential mentors.

No matter what path you take, at some point you'll have to **navigate a difficult conversation**. This might include asking for a promotion or raise, negotiating your start-up package, or resolving a dispute with a co-worker. Skilled communicators handle these conversations with confidence, grace, and diplomacy.

Management and leadership

In any position that involves managing people, you need to know how to facilitate effective teamwork and manage operations. The necessary competencies include planning and organizing projects; delegating responsibilities; providing instruction, guidance, and feedback to your team; and handling conflicts that arise between students or employees. Time management is an important skill for everyone, but it's especially important for managers balancing several projects while overseeing a staff that relies on them for timely assistance and feedback. Moreover, good leaders don't just supervise their employees; they create a vision and goals for their teams, motivate and inspire progress toward those goals, and serve as role models by demonstrating the behaviors they want others to display, learn from, and pass on.

Professionalism

Professionalism means adhering to the rules and regulations of your workplace and **demonstrating work-place etiquette**. It also means being a good colleague by **fulfilling your commitments, meeting deadlines, and fostering good workplace relationships**. Professionalism extends beyond your laboratory or office and into your **institution and scientific discipline**. You may be expected to serve on institutional or professional society committees, participate in extracurricular departmental functions, or serve on editorial and advisory boards. These activities are a great way to network, gain experience, and demonstrate your commitment to your field, and they can be very important to your professional advancement. And all these activities require—or at least greatly benefit from—professionalism.





Responsible Conduct of Research

The scientific research enterprise is built on a foundation of trust, and each of us must be committed to maintaining its integrity. **Careful record-keeping** is paramount: Scientific records should provide sufficient information to allow others to replicate your work. Researchers need to be well-versed in **data ownership and sharing standards**, so that they know when it is and is not appropriate to access, modify, and share data, and what rules they should follow when doing so. They must also adhere to the **rules regulating research with humans and animals**. They must understand and adhere to standards for authorship: What contributions must one make to a project to be listed as an author? What determines authorship order? How should work by other scientists be cited to avoid plagiarism? You should be able to identify and manage research misconduct and real or perceived conflicts of interest when you encounter them. Failure to manage these issues well could damage your reputation and lead to poor performance evaluations and even termination.

Career Development

The last group of skills in the myIDP skills assessment is not specific to science. Rather, these are skills that help you improve your ability to explore available career options, make a positive impression on potential employers, and land the job you want. Perhaps the most important of such skills is **networking**; you should take advantage of the many opportunities your training offers to connect with other people, whether at department seminars, happy hours, or conferences. Professional networks often spark collaborations and lead to job opportunities. They can also make you a better scientist.

While still a graduate student, you should start to **become familiar with the career exploration resources available to you**. These include the career counselor at your university, your postdoc office, online resources such as *Science* Careers, and the library. myIDP lists an extensive collection of career resources (free, private registration required for access). Although you may not be ready to start applying for jobs, you should learn what you'll need to do to create a competitive **application** and begin adding relevant experiences to your CV or resume. If you haven't had practice **interviewing or negotiating**, you may want to read up on effective techniques or take a workshop or seminar.

Using the myIDP Self-Assessment Scale

When using myIDP to conduct your self-assessment, you'll be asked to rate your proficiency in each skill and knowledge area on a scale of 1 to 5, where 1 is "highly deficient" and 5 is "highly proficient." The assessment will be most helpful if you use the full range of scores—that is, don't hesitate to assign yourself a 1 or a 5. Rating just a few items as a "1" will help distinguish the skills that need the most improvement, and rating just a few items as a "5" will help discern the skills you are best at. Although you might find it helpful to solicit input from your mentor, colleagues, or even family and friends, this scale is intended to be your personal subjective assessment of whether your skills are appropriate for your level of training.

Next Steps

After completing the myIDP skills assessment, you'll be able to compare your skills to those needed in various scientific careers. Some of these skills can be honed in the context of your lab work or teaching responsibilities, while others may require you to explore learning and professional opportunities outside the lab. *The NPA Postdoctoral Core Competencies* includes a list of resources to help develop many of the skills described above.

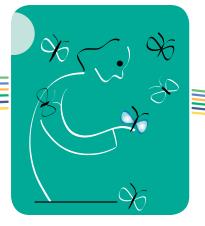
As you approach the end of your training, it's important not to lose focus. But it's equally important to set aside some time to prepare for the next phase of your career.

Postdoc and research

opportunities in Brazil



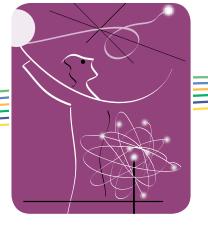




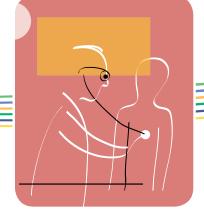


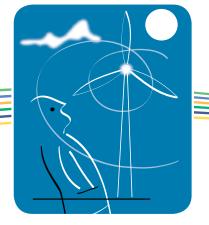














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Key Research Areas

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About Us

Fifty percent of all science created in Brazil is produced in the State of São Paulo. The state hosts three of the most important Latin American universities: USP, UNICAMP and UNESP. Other universities and 19 research institutes are also located in São Paulo, among them the renowned Instituto Tecnológico de Aeronáutica (ITA), Instituto Nacional de Pesquisas Espaciais (INPE) and Laboratório Nacional de Luz Síncrotron, besides most of Brazilian Industrial P&D.

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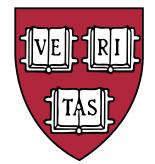
In the first case, positions are advertised at www.fapesp.br/oportunidades/ and candidates are selected through international competition. In the second, the proposal must represent an addition to a pre-existent research group and should be developed in association with faculty in higher education and research institutions in São Paulo. More information at www.fapesp.br/en/5427.n/5427.

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The Department is actively seeking postdoctoral fellows in a wide variety of fields within molecular and cellular biology. We are seeking innovative Postdocs who are creative in their experimental approach and willing to try dynamic methods and protocols. We encourage applicants from various backgrounds and promote diversity throughout the University. Postdoctoral appointments are initially 1 year in duration, renewable on an annual basis.

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Key Recruitment Areas

The scientific questions explored in the department span a wide range that include as diverse topics as Biochemistry and Biophysics, Genetics and Genomics;
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About Us

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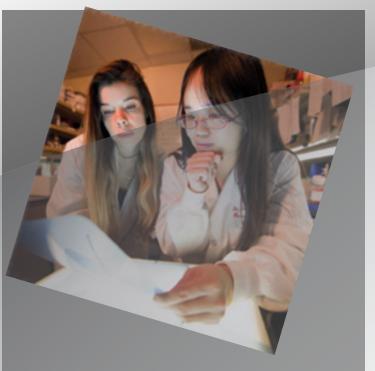
Although our faculty's research represents traditional and interdisciplinary fields of biology, the department's growth and development in recent years also reflects the revolution occurring in biology that benefits from new genome-wide approaches, powerful new computer and microscope tools, and cross-fertilization of discoveries in biology and other science and engineering disciplines.

The many collaborative projects between laboratories at MCB provide a compelling demonstration that the interaction of scientists in distinctly different areas of expertise can result in groundbreaking new discoveries that wouldn't be possible in a scientific monoculture. A wide range of scientific lectures, conferences and cultural events bring people from disparate fields together on almost a daily basis.



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Key Attractions

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